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UNIVERSITY OF ILLINOIS **BULLETIN**

AVIATION GROUND SCHOOL



UNIVERSITY OF ILLINOIS INSTITUTE OF AVIATION URBANA

AERONAUTICS BULLETIN NUMBER

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by

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University of Illinois*

AVIATION GROUND SCHOOL

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Foreword

The University of Illinois has been interested actively in aviation for a period of time dating at least from World War I. During World War II that interest increased and culminated in the establishment of the Institute of Aviation in 1945 which, among its various activities, conducts aeronautical research, flight training, and subprofessional technical courses for students of the University.

The Link Foundation, recognizing the pioneering experience of the Institute of Aviation, provided a grant to the University of Illinois Foundation for use by the Institute to prepare and publish information about its program, believing that the compilation of this information might be valuable to other institutions and to other segments of the aviation industry considering the establishment of similar activities.

This bulletin, the first of five such publications, attempts to give the basic information necessary to organize and operate an aviation ground school course to accompany flight training. Other bulletins published under The Link Foundation grant cover flight training operations, the organization of an aircraft repair and maintenance unit, the organization of a college-level aircraft and engine maintenance curriculum, and the operation of a university airport including essential facts and figures about repair and maintenance services. While the aim has been to provide sources of general information, there is frequent reference to the operations of the University of Illinois aviation program for illustrative purposes.

In the preparation of the material for this bulletin Mr. Glen Amundson, Ground School Instructor of the Institute of Aviation staff, has been most helpful.

In this monograph, as in all publications of the Institute, the author has had complete freedom to express his opinions, with the understanding that he will assume sole responsibility therefor.

LESLIE A. BRYAN, *Director*

October, 1954

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Aviation 101 students plan a cross-country flight.

Purpose

Ground-school or preflight instruction is an integral part of any college or university aviation flight program. The Civil Aeronautics Administration (C.A.A.) requires applicants for private pilot and commercial pilot certificates to pass written "aeronautical knowledge" examinations. Such instruction can be more economically and more efficiently taught in the classroom rather than in individual student-instructor conferences. The subject matter is comprehensive enough so that the content of the course can be taught at the college level.

Airman Agency Certificates

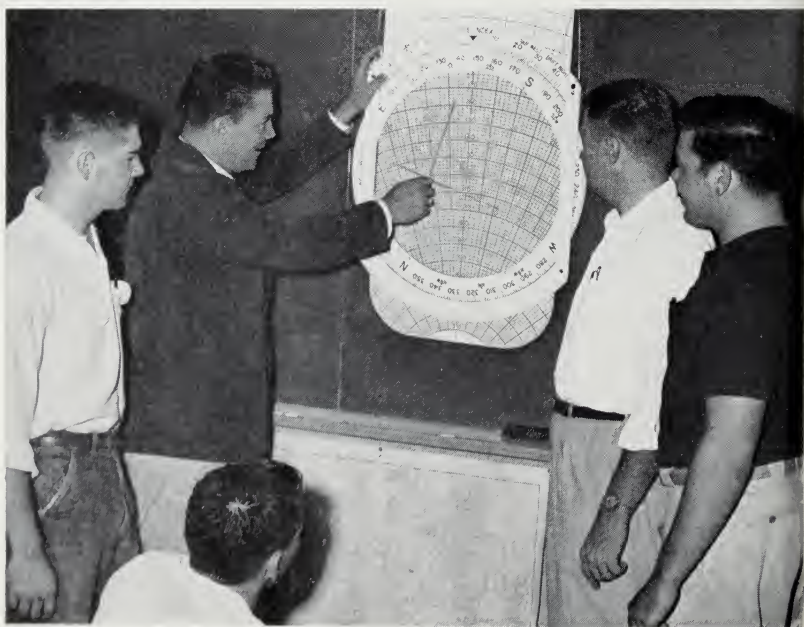
The C.A.A. issues the Airman Agency Certificates for Basic (Private Pilot) Ground Schools and Advanced (Commercial Pilot) Ground Schools as provided for in Part 50 of the Civil Air Regulations. Airman Agency Certificates are also required when an Instrument Flight School or a Flight Instructor School is established. Civil Aeronautics Manual 50, available from the Superintendent of Documents, U. S. Government Printing Office, contains material which interprets and explains the requirements that are specified in Part 50 of the Civil Air Regulations. Both Civil Air Regulations and the Civil Aeronautics Manuals are constantly being revised to meet the needs of changing conditions. It is therefore important that anyone setting up an aviation curriculum, which is subject to approval by the C.A.A., be cognizant of the current regulations and interpretations. The status of Civil Air Regulations and Manuals can always be ascertained by requesting this information from the C.A.A., Office of Aviation Information, Washington 25, D. C.

University Credit

At the University of Illinois, students receive their credits and their grades because of their work in ground school. A student's flying is considered in much the same light as laboratory work in a science course. The reward for the student's successful passing of his flight test is his C.A.A. certificate. His reward for successful ground-school work is his course credit and his grade. Such a system tends to maintain scholastic standards and enables the ground instructor to cover adequately a great deal more material than is required by the C.A.A. No one, however, is permitted to take ground school for credit without flight, or vice versa. In the very rare case in which the flight instructor recommends that a



Aviation 102 students check the daily weather map.



Aviation 103 students work a navigation problem on the E-6B Computer.

student not continue with his flying, the student is allowed to continue in the ground school and receive full credit if he passes the course.

Class Schedule Coordination

The ground school coordinates its activities with the other units within the University by scheduling its classes to make for a minimum loss of time in taking the flight instruction. Ground school is taught on the campus on the same time-table arrangement as the other University course offerings. The student ordinarily takes ground-school instruction on a Monday-Wednesday-Friday sequence for a fifty-minute period, and his flight training on a Tuesday-Thursday-Saturday sequence. Since the airport is about six miles from the University, the students are transported there by University bus. The bus leaves for the airport ten minutes after campus classes are over and returns from the airport in time to allow a student to attend classes which begin one hour and fifty minutes after he left the campus. This time allowance gives the student adequate time for transportation, for a fifteen-minute period before and after his flight training for a discussion with his flight instructor, and for an hour of flight instruction. Since ground school is group instruction and flight training is individual instruction, the best utilization of student and instructor time is by an arrangement such as the above rather than by an attempt to give ground school at the airport followed immediately by flight instruction. When possible, ground-school subjects are introduced at a time which will coincide with the student's flight training. Civil Air Regulations (C.A.R.), for example, is taught at the beginning of Aviation 101 because every student must pass a prescribed examination in C.A.R. before his first solo flight.

The ground-school curriculum complements the flight curriculum. The major problems occur in coordinating the subject matter in ground school with the activities in flight training. Since flight operations slow down or speed up with the weather, students may finish their flight work before they finish the ground-school course. Flight instructors also attempt to complete their students' flight training before final examination week. Usually the C.A.A. wishes to have the written "aeronautical knowledge" examination concluded before the flight test is given. However, if the ground school instruction is as intensive as a university would normally give, the C.A.A. may be willing to allow the flight examination to be given prior to the final examination in ground school which normally is scheduled with the rest of the university examinations. It is necessary to coordinate this matter with the C.A.A. unless, as at the University of

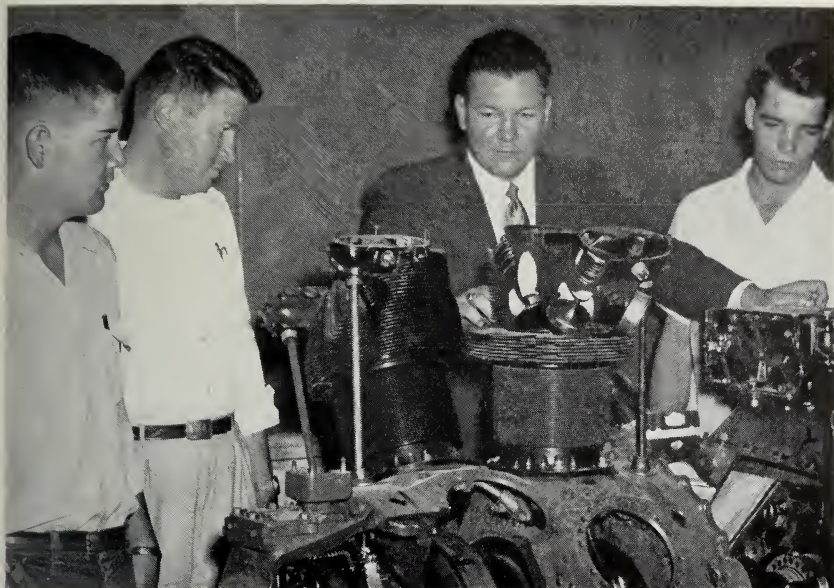
Illinois, the C.A.A. has accredited the University to formulate and to give its own examinations and then to certify to the C.A.A. those students who successfully complete the course.

Instructor Qualifications

At the University of Illinois, a ground-school instructor must possess at least a bachelor's degree and have the personal and professional qualifications which meet the approval of the Board of Trustees. It is desirable that ground-school instructors hold a commercial pilot's license. C.A.A. Manual 50 requires ground-school instructors to hold federal instructor's certificates with ratings appropriate to the subjects to be taught, or else to work directly under a principal instructor holding the certificate and the necessary ratings. The current ground-school instructor ratings are navigation, aircraft, meteorology, aircraft engines, civil air regulations, radio navigation, and Link trainer operator. Persons seeking the C.A.A. instructor's certificate must take the subject examinations by making arrangements with the nearest C.A.A. safety agent. One ground-school staff member can teach fifteen scheduled classroom-hours per week during the regular semester and eighteen classroom-hours per week during the summer. This is, however, above the twelve-hour teaching load suggested by experience as being desirable.

Classroom Facilities

Manual 50 clearly defines the minimum classroom facilities required for all C.A.A. approved ground schools. These requirements are easily met by educational institutions, since nothing unusual is required in the way of desks, blackboards, illumination, etc. Classroom equipment necessary for the Basic Ground School requirement includes only the texts and the related source materials which cover the subjects listed in Manual 50. However, it is desirable to have available as much as possible of the Advanced Ground School equipment, which is listed also in Manual 50, even though only a Basic Ground School is in operation. Colleges and universities which have flight programs and which own their own aircraft, or have aeronautical engineering courses, easily meet the equipment requirements of Manual 50, since they already have many of the required aircraft components prepared for student research and operation. Extra equipment, which is not required but which may be used to good advantage, includes the following: a classroom model of the E-6B computer,



Aviation 104 students investigate the workings of an engine.

obtainable from Weems Navigation Service, Annapolis, Maryland; a model wind tunnel from Aero Publishers, Incorporated, Los Angeles, California; a set of "Linguaphone" records for teaching Morse code; a Link Aviation, Inc., type radio range simulator; and charts from various instrument manufacturers showing cutaway views of their products. Such extra equipment can be obtained at an estimated total cost of \$125.

It is both economical and acceptable to hold the private pilot and the commercial pilot ground-school instruction in the same classroom. This room should be equipped with dark shades and with a screen so that movies and slides may be presented. Space should also be available for other teaching aids such as mock-ups and charts.

Summary of Aviation Courses

The following chart is a summary of the aviation courses involving flight training which are currently being given by the University of Illinois. The appendix gives a more comprehensive summary of the content of the ground-training courses.

COURSES	GROUND TRAINING	FLIGHT TRAINING	AIRCRAFT
Avi. 101 Private Pilot Prepares student for C.A.A. Private Pilot Rating. Credit 3 hrs. Fee \$250	48 hours 1. Civil Air Regulations 2. Aerial Navigation 3. Radio 4. Meteorology 5. General Service of Aircraft	38 hrs + 13 hrs flight discussion DAY Dual 18 Solo 10 Observer 6 Link 11* NIGHT Dual 2 Observer 2	Two-place Tandem Monoplane, 65-h.p.
Avi. 102 Secondary Second step toward a C.A.A. Commercial Pilot Rating. Credit 3 hrs. Fee \$250	48 hours 1. Aircraft Engines 2. Meteorology	44 hrs Dual 6 Solo 16 Dual 10 Solo 12	Two-place Side-by-side Mono- plane, 90-h.p. Two-place Tandem Biplane, 220-h.p.
Avi. 103 Intermediate Third step toward a C.A.A. Commercial Pilot Rating. Credit 3 hrs. Fee \$250	48 hours 1. Aerial Navigation and Use of E-6B Computer 2. Radio	44 hrs CROSS- COUNTRY Day Dual 8 Solo 20 Night Dual 3 Solo 0 INSTRUMENT Flight 5 Link 5 NIGHT Dual 1 Solo 2	Two-place Side-by-side Mono- plane, 90 h.p., and Two-place Tandem Monoplane, 65-h.p.
Avi. 104 Advanced Final step toward a C.A.A. Commercial Pilot Rating. Credit 3 hrs. Fee \$250	48 hours 1. Civil Air Regulations 2. Aircraft 3. Review for C.A.A. Commercial Pilot's Written Examination	44-49 hrs Dual 14-19 Solo 30	Two-place Tandem Monoplane, 65-h.p., and Four-place Monoplane, 185-h.p.
Avi. 205 Flight Instructor Prepares Commercial Pilot for C.A.A. Flight Instructor Rating. Credit 3 hrs. Fee \$250	48 hours 1. Techniques of Flight Instruction 2. Theory of Flight	26-32 hrs Dual 5 Solo 6 Instructor Practice 15	Two-place Tandem Monoplane, 65-h.p.
Avi. 206 Instrument Flight Prepares Commercial Pilot for C.A.A. Instrument Rating. Credit 3 hrs. Fee \$250	48 hours 1. Civil Air Regulations 2. Meteorology 3. Aircraft and Theory of Flight 4. Navigation 5. Instruments, Radio, and Navigational Aids 6. Instrument Flight Procedures	20-30 hrs Dual 20-30 Link 10-20	Four-place Monoplane, 145-h.p.

The Commercial Pilot rating granted at the successful conclusion of Avi. 104 meets the requirements of both the United States Civil Aeronautics Administration and the International Civil Aviation Organization.

Avi. 291 and Avi. 292 prepare the commercial pilot for special ratings, such as multi-engine and seaplane ratings. Each gives 1 credit and consists of 16 hours of ground school and 15 hours of flight training. Fee for each, \$250.

* The use of the school link trainer will be more fully explained in a subsequent Bulletin describing flight instruction.

Appendix

Ground Training — 48 classroom hours

- I. Civil Air Regulations
 - A. Part 1 — Certification, Identification, and Marking of Aircraft and Related Products
 - B. Part 3.20 — Airplane Categories: 3.20 (a) (1), (2), (3)
 - C. Part 20 — Pilot Certificates
 - D. Part 43 — General Operation Rules
 - E. Part 60 — Air Traffic Rules
 - 1. Visual flight rules operation
 - 2. Instrument flight rules operation
 - 3. VFR and IFR flight plan operation
 - 4. Air traffic control practices and procedures
 - F. Part 62 — Notice and Reports of Aircraft Accidents and Missing Aircraft
- II. Meteorology
 - A. Weather recognition
 - B. Icing
 - C. Fog
 - D. Frontal characteristics, with particular emphasis on thunderstorms
 - E. General cloud formations and their relationship to weather characteristics
 - F. Weather maps and symbols
 - G. Teletype sequences and symbols
 - H. Elementary weather forecasting
 - I. Pressure areas and their characteristics
 - J. Significance of isobaric patterns
 - K. Winds aloft
 - L. Humidity-temperature-dewpoint relationship and significance to the pilot
 - M. Precipitation
 - N. Practical application of meteorological knowledge to safe flying practices
 - O. Services and assistance available from the U. S. Weather Bureau
- III. Aerial Navigation and Radio
 - A. Navigational methods
 - 1. Pilotage
 - 2. Dead reckoning
 - 3. Basic radio aids to navigation
 - 4. Elementary radio orientation

- B. Navigational instruments commonly used
- C. Basic use of computer (D-4 or Mark VIII)
- D. Proper use of flight plans
- E. Proper use of published aids
 - 1. Flight Information Manual
 - 2. Airman's Guide
 - 3. NOTAMS
- F. Explanation of radio aids to flight
- G. Proper use of radio
- H. Voice procedure and phraseology
- I. Flight assistance services

IV. General Service of Aircraft and Safety Practices

- A. Care of aircraft
 - 1. Preflight inspection procedures
 - 2. Explanation of preventive maintenance, repair, and required inspections
- B. Care of engines
 - 1. Preflight inspection procedures
 - 2. Fuel requirements
 - 3. Proper starting, warm-up, and shutdown procedures
 - 4. Explanation of preventive maintenance, repair, and required inspections
 - 5. Use of operating manual
 - 6. Functions, limitations, and characteristics errors of instruments required under Part 43
- C. Flight safety practices
 - 1. Operation under conditions of high altitude, extreme temperatures, gross weight, and icing
 - 2. Wing ice, propeller ice, and carburetor ice
 - 3. Adverse surface conditions (rough, soft, and slippery)
 - 4. Turbulent air
 - a. Mountain and canyon effects
 - b. Surface obstruction and thermal effects
 - 5. Marginal visibility during day and night operations
 - 6. Radio communications failure
 - 7. Low fuel supply
 - 8. Aerodynamic effect of frost or snow on airfoils
 - 9. Maximum range versus maximum endurance operation
 - 10. Proper tie-down or securing of aircraft
 - 11. Emergency assistance and low procedures
 - 12. Use of landing lights and flares
 - 13. Obstructions to flight, such as antennae, poles, and birds
 - 14. Procedure when operating unfamiliar aircraft

Ground Training — 48 classroom hours

- I. Meteorology
 - A. General cloud formations and accompanying weather
 - 1. High, middle, and low cloud groups
 - 2. Clouds of vertical development
 - B. Pressure areas
 - 1. Motion of air masses
 - 2. Isobars
 - 3. Winds aloft
 - C. Humidity and its relation to visibility
 - D. Temperature-dewpoint relationship and precipitation
 - E. Recognition of weather conditions
 - 1. Icing
 - 2. Fog
 - 3. Frontal conditions
 - 4. Forecasting of weather conditions accompanying the above
 - F. Use of knowledge of meteorology in flying to promote safety
 - G. U. S. Weather Bureau facilities
 - 1. Weather assistance service
 - 2. C.A.A. flight assistance service
 - H. Teletype sequences and coded weather data
 - 1. Interpretation of symbols
 - 2. Pilot use of teletype services
- II. Weather Maps
 - 1. Interpretation of symbols used
 - 2. Analysis
 - a. Pressure areas
 - b. Fronts
- III. Aircraft Engines
 - A. Principles of the internal combustion engine
 - B. Fuels
 - 1. Octane rating
 - 2. Detonation
 - C. Construction and design
 - 1. Metals
 - 2. Tolerances
 - 3. Compression ratios
 - 4. Horsepower

- D. Classification and construction of engine components
- E. Lubrication and cooling systems
- F. Carburetion and ignition
- G. Propellers
 - 1. Fixed
 - 2. Adjustable
 - 3. Controllable
 - 4. Constant speed
 - 5. Full-feathering
- H. Disassembly
- I. Inspection and maintenance
- J. Overhaul, repair, timing, and assembly
- K. Trouble shooting
- L. Logbooks and other records
- M. Practices
 - 1. Precautions in the operation of engines
 - 2. Procedures
 - a. Starting
 - b. Warm-up
 - c. Idling
 - d. Testing
 - e. Full throttle operation

Ground Training — 48 classroom hours

- I. Navigation
 - A. Map and chart making
 - 1. Types of projections
 - 2. Lambert conformal projection
 - B. Navigational methods
 - 1. Pilotage
 - 2. Dead reckoning
 - 3. Radio
 - C. Navigational instruments and their limitations
 - D. Airman's Guide and Flight Information Manual
 - E. Use of Sectional and World Aeronautical Charts
 - F. Use of radio in navigation
 - 1. Radio compass and direction-finder equipment
 - 2. Radio ranges
 - a. Low frequency
 - b. Very high frequency
 - G. Practical navigation problems
 - 1. Planning a flight
 - 2. Laying out and measuring a course
 - 3. Solution of wind triangle with computer
 - 4. Estimating ETA
 - 5. Filing flight plan, including climb and let-down
 - 6. Check points
 - 7. Fuel consumption
 - 8. Unexpected headwinds
 - 9. Radius of action
 - 10. Radius of action to an alternate airport
 - 11. Maximum endurance under economy cruising conditions

II. Radio

- A. Radio aids to flight
- B. Types of radio receivers
 - 1. Tuning
 - 2. Explanation of frequencies
 - 3. Static and night effects
 - 4. Antennas
- C. Radio transmitters
 - 1. Use
 - 2. Voice procedures and microphone techniques
 - 3. Federal Communications Commission regulations
 - 4. Antennas
- D. International Morse code
- E. Radio aids to air navigation
 - 1. Low frequency aids, uses and limitations
 - 2. Very high frequency aids, uses and limitations
 - 3. Omnidirectional facilities
- F. Use of loop antenna
 - 1. Homing on broadcast and other stations
 - 2. Establishing a radio fix
- G. Aeronautical lights
- H. Distress signals
- I. Airways traffic control
- J. Approach control
- K. Airport traffic control

Ground Training — 48 classroom hours

- I. Aircraft, General Service and Safety Practices
 - A. Theory of flight
 1. Forces acting upon an aircraft in flight
 2. Lift, gravity, thrust, and drag
 - B. Characteristics of air as a fluid mass
 - C. Performance characteristics of aircraft
 1. Ground effect
 2. Design
 3. Gust load safety factors
 4. Operating limitations
 - D. Care and maintenance of equipment
 1. Pressure, quantity, and rate instruments
 2. Radio and electronic equipment
 3. Flotation devices
 4. Fire extinguishers
 5. Safety belts
 6. Windshields, windows, and canopies
 7. Emergency exits
 8. Parachutes
- II. Supervised review of navigation, meteorology, and civil air regulations, including Part 42, in accordance with the needs of the individual students before taking the prescribed aeronautical knowledge examinations for the commercial pilot rating

Ground Training — 48 classroom hours

- I. Principles of Flight Instruction
 - A. Steps in teaching students to fly
 - B. Common errors in instruction
 - C. How students learn
 - D. Adapting training to individual students
 - E. Keeping students interested
 - F. Keeping students fit
 - G. Analyzing student progress
 - H. Self-analysis of ability as an instructor

- I. Summary of points to remember in flight instruction
 - J. Civil air regulations
 - K. Final examination
- II. Fundamentals and Psychology of Instructing

AVIATION 206 — INSTRUMENT FLIGHT COURSE

Ground Training — 48 classroom hours

- I. Civil Air Regulations
 - A. Parts 1, 20, 43, and 60
 - B. Special emphasis on Part 60 and Instrument Flight Rules
- II. Meteorology
 - A. Detailed study of instrument flying conditions with emphasis on icing conditions
 - B. Weather maps
 - C. Fronts
 - D. Weather analysis
- III. Aircraft and Theory of Flight
 - A. Deicing equipment, static eliminators
 - B. Effect of ice on propeller and wing efficiency
 - C. Power required under local conditions and change in stalling speeds therein
- IV. Navigation
 - A. Navigational problems under instrument conditions
 - B. Use of computer
 - C. Methods of obtaining fixes
 - D. Off-course problems
 - E. Alternate airport problems
 - F. Radio orientation
- V. Instruments, Radio, and Navigational Aids
 - A. Instrument errors
 - B. Radio aids to instrument flight
- VI. Instrument Flight Procedures
 - A. Technique of instrument flight
 - B. Beam and bracketing procedures
 - C. Let-down procedures
 - D. Air traffic control procedures
 - E. Flight plans

Ground Training — 16 classroom hours

- I. Nomenclature of Seaplanes
 - A. Float type
 - B. Boat type
- II. Special Preflight Considerations
- III. Taxiing
 - A. Forces on the aircraft
 - B. Taxiing positions
 - 1. Idling
 - 2. Nose up
 - 3. On the step
- IV. Sailing
 - A. Wind effect
 - B. Control effect
- V. Approach and Departure
- VI. Take-offs
 - A. Normal
 - B. Rough-water
 - C. Glassy-water
 - D. Cross- and/or down-wind
- VII. Landings
 - A. Normal
 - B. Rough-water
 - C. Glassy-water
 - D. Cross- and/or down-wind
 - E. Emergency

Ground Training — 16 classroom hours

- I. Preflight Inspection
 - A. Airplane
 - B. Powerplant
 - C. Controls and operational equipment
- II. Operating Instructions
 - A. Starting and warm-up
 - B. Taxiing
 - C. Take-off procedure
 - D. Climb and level flight
 - E. General flying characteristics
 - F. Approach and landing
 1. Normal
 2. Cross-wind
- III. Cruise Control
 - A. Weight and balance
 - B. Speed selection
 - C. H.O.W.G.O.Z.I.T.
- IV. Emergency Equipment and Its Operation
 - A. Landing gear
 - B. Fuel pressure
 - C. Engine failure during flight
 - D. Single-engine procedure
 1. Take-off
 2. During flight
 3. Landing

References

The publications listed on the facing page are basic sources of materials included in the C.A.A. written examinations for private pilot, commercial pilot, instrument, and flight instructor ratings. These bulletins, manuals, and references are subject to revision at any time, and care should be taken to insure use of current publications. These materials may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

In addition to the listed references, many excellent articles, books, bulletins, manuals, films, and filmstrips are published by the flying branches of the U. S. Military Establishment, various manufacturers, and professional experts.

Civil Air Regulations

Part 1: Certification, Identification, and Marking of Aircraft and Related Products.....	\$.05
Part 20: Pilot Certificates05
Part 43: General Operation Rules.....	.05
Part 60: Air Traffic Rules.....	.10
Part 62: Notices and Reports of Aircraft Accidents and Missing Aircraft05
Aircraft Powerplant Handbook (C.A.A. Technical Manual No. 107)	1.50
Air Force-Navy-C.A.A. Procedures for the Control of Air Traffic..	1.00
Airman's Guide (individual copies vary in price; subscription of 26 issues per year, including Flight Information Manual)...	2.75
Airways Operations Training Series	
Bulletin No. 1 — Instrument Landing System.....	.20
Bulletin No. 2 — Location Markers and Homing Facilities...	.15
Bulletin No. 3 — Visual-Aural Ranges and Omnidirections.....	.20
Bulletin No. 4 — Distance Measuring Equipment and Offset Course Computer.....	.15
Basic Omnidirection Flying.....	Free
Facts of Flight.....	.50
Flight Instruction Manual (C.A.A. Technical Manual No. 100) ..	1.50
Flight Instructor Oral Examination Guide Book.....	.05
Meteorology for Pilots (C.A.A. Bulletin No. 25).....	1.50
Path of Flight.....	.75
Personal Aircraft Inspection Manual (C.A.A. Technical Manual No. 101)55
Questions and Answers for Private Pilots.....	.25
Realm of Flight.....	.60
Student Pilot Guide.....	.15
Terrain Flying (C.A.A. Office of Aviation Information)30

THE INSTITUTE OF AVIATION, established in 1945 as the Institute of Aeronautics, is operated as the administrative agency responsible for the fostering and correlation of the educational and research activities related to aviation in all parts of the University. Other functions include academic instruction, flight training, management of the University of Illinois Airport, and aeronautical research.

In connection with the latter function, the Institute issues two types of publications . . . first, a group of reports on research results, and second, a series of bulletins on aviation subjects of an extension-service nature to the citizens of the State.

The following publications have been issued:

- BULLETIN ONE:** Municipal Airport Management, Leslie A. Bryan, 1947. (Out of print)
- BULLETIN TWO:** Landscape Planting for Airports, Florence B. Robinson, 1948.
- BULLETIN THREE:** Labor Relations in the Air Transport Industry Under the Amended Railway Labor Act, E. B. McNatt, 1948.
- BULLETIN FOUR:** Airport Zoning, J. Nelson Young, 1948. (Out of print)
- BULLETIN FIVE:** Evaluation of the School Link as an Aid in Primary Flight Instruction, A. C. Williams, Jr. and Ralph E. Flexman, 1949.
- BULLETIN SIX:** Lightplane Tires on Turf and Concrete, Leslie A. Bryan, 1949.
- BULLETIN SEVEN:** Light Aircraft Operating Costs, Leslie A. Bryan, 1949.
- BULLETIN EIGHT:** Evaluation of the School Link and Special Methods of Instruction in a Ten-Hour Private Pilot Flight-Training Program, Ralph E. Flexman, William G. Matheny, and Edward L. Brown, 1950. (Out of print)
- BULLETIN NINE:** Flight by Periscope: I. Performing an Instrument Flight Pattern; the Influence of Screen Size and Image Magnification, Stanley N. Roscoe, 1951.
- BULLETIN TEN:** Operating Costs of a Light Aircraft Fleet, Leslie A. Bryan, 1952.
- BULLETIN ELEVEN:** 180-Degree Turn Experiment, Leslie A. Bryan, Jesse W. Stonecipher, and Karl Aron, 1954.
- BULLETIN TWELVE:** Aviation Ground School, Leslie A. Bryan, 1954

Publications of the Institute of Aviation will be sent free of charge upon request.

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